

APPENDIX I

GUNNERY EXERCISES

There are seven exercises used to train MK 19 gunners and crews. The first four exercises are individual gunnery firing exercises and allow the gun crew to practice firing prior to the collective gunnery exercises. Commanders dictate the level of MOPP used during MK 19 gunnery.

These seven tables are used for single and multiple gun-crew practice and can be conducted on any MK 19 range. Each table has columns for the task, condition, standard, ammunition required, time required, and a column to record a satisfactory or unsatisfactory (SAT Y/N) score for the task.

I-1. INDIVIDUAL GUNNERY

These first four tables are used for gunnery practice. Each single gun exercise requires the gun crew to mount and dismount the MK 19, and engage point and area targets at various ranges. The two dismounted day exercises require the gun crew to prepare a range card and engage targets using data from the range card (Tables I-1 and Table I-2). The third exercise (Table I-3) is a mounted combat exercise and the fourth exercise (Table I-4) is a night fire exercise.

a. **Instructional Fire Exercise** (Table I-1). The instructional firing exercise gives the crew practice firing on a range.

ACTION	CONDITIONS	STANDARDS	AMMO	TIME	SAT Y/N
1. Mount the MK 19 on the M3 tripod.	Given a MK 19, M3 tripod, T&E mechanism, MK 64 gun cradles, and a firing position.	Gun crew must be able to mount the MK 19 in its tripod mode within 1 min.	0	1 min	
2. Prepare a range card.	Given a MK 19 mounted on a M3 tripod, and a firing position with a designated sector of fire and targets.	Gunner must prepare a completed range card within 15 min.	0	15 min	
3. Zero the MK 19 while using a 400-meter BMP target.	Given a tripod-mounted MK 19, 400-meter BMP target, selected firing position, and 4 rds of 40-mm TP.	Gunner must impact on the target with at least 2 of the 4 rds on the BMP target at 400 meters.	4 rds	N/A	
4. Engage a BMP target at 1,100 meters while using range card data (point target).	Given a tripod-mounted MK 19, completed range card, BMP target at 1,100 meters, selected firing position, and 8 rds of 40-mm TP.	Gunner must impact on the 1,100 meter BMP target with at least 2 out of 8 rounds.	8 rds	N/A	
5. Engage a BMP target at 1,500 meters while using range card data.	Given a tripod-mounted MK 19, completed range card, BMP target at 1,500 meters, selected firing position, and 8 rds of 40-mm TP.	Gunner must impact on the 1,500 meter BMP target area with at least 1 out of 8 rds.	8 rds	N/A	
6. Engage dismounted troops at 600 meters while using range card data (area target).	Given a tripod-mounted MK 19, completed range card, dismounted troop targets at 600 meters, selected firing position, and 6 rds of 40-mm TP.	Gunner must impact at least 4 out of 6 rds within 5 meters of a silhouette at a range of 600 meters.	6 rds	N/A	
7. Dismount the MK 19.	Given a MK 19, M3 tripod, and a selected firing position.	Gun crew must dismount the MK 19 from the M3 tripod within 1 min.	0	1 min	
Total: 26 rds					
<p align="center">Exercise Scoring</p> <p align="center">Fully Trained (T) = Satisfactory on 7 of 7 tasks Need practice (P) = Satisfactory on 5 or 6 tasks Untrained (U) = Unsatisfactory on 4 or fewer tasks</p>					

Table I-1. Instructional fire exercise.

During scoring procedures, the grader positions himself so that he can observe both the gunner and the target. Once the exercise commences, he:

- Times the tasks having a time standard.
- Observes and informs the gunner of the strike of the rounds.
- Records the results of each task in the right hand column with a "Y" for a satisfactory completion of the task or an "N" for an unsatisfactory completion.
- Sums the results and assigns an overall score in accordance with the scores in the bottom box of the figure above.

b. **Dismounted Range Card Exercise** (Table I-2). The dismounted range card exercise is held after instructional fire and gives the gunner and crew a chance to test their skills against a time-and-hit exercise. It is held as often as the commander feels necessary to maintain crew skills.

(1) Time the gunner and crew while they place the tripod-mounted MK 19 into operation in a selected location.

(2) Time the gunner while he completes a range card with the ranges of all targets within his sector of fire.

(3) Have the gunner suppress or kill single or multiple targets in his sector of fire while using his range card data.

(4) Time the gunner and crew while they take the MK 19 out of operation.

ACTION	CONDITIONS	STANDARDS	AMMO	TIME	SAT Y/N
1. Mount the MK 19 on an M3 tripod.	Given a MK 19, M3 tripod, M64 gun mount, T&E mechanism, and a selected firing position.	Gun crew must mount the MK 19 on the M3 tripod within 1 min.	0	1 min	
2. Prepare a range card.	Given a MK 19 mounted on a M3 tripod, a firing position with an assigned sector of fire, and designated targets.	Gunner must prepare a completed range card with all targets in his sector of fire within 15 min.	0	15 min	
3. Zero the MK 19 while mounted on the M3 tripod at a 400-meter BMP.	Given a tripod-mounted MK 19, selected firing position, 400-meter BMP target, and 4 rds of 40-mm TP.	Gunner must impact at least 2 out of 4 rds on the 400-meter BMP target.	4 rds	N/A	
4. Engage a 600-meter and tripod-mounted BMP target while using range card data (point target).	Given a tripod-mounted MK 19, selected firing position, 600-meter BMP target, and 4 rds of 40-mm TP.	Gunner must impact at least 3 out of 4 rds on the 600-meter BMP target within 1 min.	4rds	1 min	

Table I-2. Dismounted range card exercise.

ACTION	CONDITIONS	STANDARDS	AMMO	TIME	SAT Y/N
5. Engage a 1,100-meter BMP target while using range card data.	Given a tripod-mounted MK 19, selected firing position, BMP target at 1,100 meters, completed range card, and 8 rds of 40-mm TP.	Gunner must impact on BMP target at 1,100 meters with at least 2 out of 8 rds within 2 min.	8 rds	2 min	
6. Engage a 600-meter (area) troop target while using the range card data.	Given a tripod-mounted MK 19, 6 rds of 40-mm TP, selected firing position, and a troop target at 600 meters.	Gunner must impact at least 4 out of 6 rds within 5 meters of a troop silhouette at a range of 600.	6 rds	1.5 min	
7. Engage a BMP target at 1,500 meters while using the range card data.	Given a tripod-mounted MK 19, 8 rds of 40-mm TP, selected firing position, BMP target at 1,500 meters, and a completed range card.	Gunner must impact on the 1,500 meter BMP target with at least 4 out of 8 rds within 2 min.	8 rds	2 min	
8. Engage a BMP target at 1,100 meters and dismounted troops at 600 meters while using range card data.	Given a tripod-mounted MK 19, 12 rds of 40-mm TP, BMP target at 1,100 meters, dismounted troop target at 600 meters, and a completed range card.	Gunner must impact at least 2 rds on the BMP target at 1,100 meters, then shift to a dismounted troop target and place at least 2 rds within 5 meters of a troop silhouette at a range of 600 meters.	12 rds	3 min	
9. Dismount the MK 19 from the M3 tripod.	Given a mounted MK 19.	Gun crew must take the MK 19 out of operation from the tripod mount within 1 min.	0	1 min	
Total: 42 rds					
Exercise Scoring Fully Trained (T) = Satisfactory on 9 of 9 tasks Need Practice (P) = Satisfactory on 7 or 8 tasks Untrained (U) = Unsatisfactory on 6 or fewer tasks					

Table I-2. Dismounted range card exercise (continued).

During scoring procedures, the grader positions himself so that he can observe both the gunner and the target. Once the exercise commences, he:

- Times the tasks having a time standard.
- Observes and informs the gunner of the strike of the rounds.
- Records the results of each task in the right hand column with a “Y” for a satisfactory completion of the task or an “N” for an unsatisfactory completion.
- Sums the results and assigns an overall score in accordance with the scores in the bottom box of the figure above.

c. **Mounted Combat Exercise.** The mounted combat exercise gives the gunner and the crew practice fighting from a vehicle. It is held as often as the commander feels necessary to maintain crew skills (Table I-3).

(1) Time the gun crew while they place the MK 19 into operation on its organic carrier. Carriers may be HMMWVs, 2 1/2-ton trucks, M151-series utility trucks, or M113-series APCs.

(2) Using the time-and-hit standards, give the gunner and crew a series of single and multiple targets to suppress or kill in their sector of fire.

(3) Upon completion of mounted firing, time the gunner and crew while they take the MK 19 out of operation.

ACTION	CONDITIONS	STANDARDS	AMMO	TIME	SAT Y/N
1. Mount the MK 19 on its organic carrier.	Given a MK 19, organic carrier, and a selected firing position.	Gun crew must mount the MK 19 on its organic carrier within 2 min.	0	2 min	
2. Engage a BMP target at 400 meters while mounted.	Given a MK 19, organic carrier, 4 rds of 40-mm TP, and a selected firing position.	Gunner must impact on the BMP target with at least 3 out of 4 rds at 400 meters within 1 min.	4 rds	1 min	
3. Engage a BMP target at 800 meters while mounted.	Given a MK 19, organic carrier, 8 rds of 40-mm TP, and a selected firing position.	Gunner must impact a BMP target at 800 meters with at least 3 out of 8 rds within 1.5 min.	8 rds	1.5 min	
4. Engage a 600-meter (area) target.	Given a MK 19, organic carrier, 6 rds of 40-mm TP, and a selected firing position.	Gunner must impact at least 4 out of 6 rds within 5 meters of a troop silhouette at a range of 600 meters.	6 rds	1.5 min	
5. Engage a BMP target at 1,100 meters.	Given a MK 19, organic carrier, 8 rds of 40-mm TP, and a selected firing position.	Gunner must impact the BMP target area at 1,100 meters with at least 2 out of 8 rds within 2 min.	8 rds	2 min	
6. Dismount the MK 19 from its organic carrier.	Given a MK 19 and an organic carrier.	Gun crew must dismount the MK 19 from its organic carrier within 2 min.	0	2 min	
Total: 26 rds					
Exercise Scoring Fully Trained (T) = Satisfactory on 6 of 6 tasks Need Practice (P) = Satisfactory on 5 tasks Untrained (U) = Unsatisfactory on 4 or fewer tasks					

Table I-3. Mounted combat exercise.

During scoring procedures, the grader positions himself so that he can observe both the gunner and the target. Once the exercise commences, he:

- Times the tasks having a time standard.
- Observes and informs the gunner of the strike of the rounds.
- Records the results of each task in the right hand column with a “Y” for satisfactory completion of the task or an “N” for an unsatisfactory completion.
- Sums the results and assigns an overall score in accordance with the scores in the bottom box of the figure above.

d. **Night Fire Exercise** (Table I-4). This LFX develops and improves MK 19 gunnery skills at night or during degraded conditions. This exercise is conducted as often as the commander feels it is necessary to maintain crew skills.

ACTION	CONDITIONS	STANDARDS	AMMO	TIME	SAT Y/N
1. Mount the AN/TVS-5 to the MK 19.	At night, given an AN/TVS-5 complete, a MK 19, M3 tripod, and a T&E mechanism.	Gunner must mount the AN/TVS-5 on the MK 19 within 2 min.	0	2 min	
2. Engage a 400-meter BMP target using a zeroed MK 19 with an AN/TVS-5 mounted for observation.	At night, given an AN/TVS-5 complete, a MK 19, an M3 tripod, 6 rds of 40-mm TP, and a 400-meter BMP target, during the hours of daylight.	Gunner must impact 3 out of 6 rds on a BMP target at 400 meters within 1 min.	6 rds	1 min	
3. Engage a BMP target at 600 meters.	At night, given a MK 19, 8 rds of 40-mm TP, and a target at a distance of 600 meters.	Gunner must impact on a BMP target with at least 4 out of 8 rds at 600 meters within 2 min.	8 rds	2 min	
4. Engage a dismounted troop target at 800 meters.	At night, given a MK 19, 8 rds of 40-mm TP, and a target at a distance of 800 meters.	Gunner must impact within 5 meters of a silhouette target with at least 4 out of 8 rds at 800 meters within 2 min.	8 rds	2 min	
5. Dismount AN/TVS-5 from the MK 19.	At night, given a MK 19 and an AN/TVS-5.	Gun crew must take the AN/TVS-5 out of operation within 2 min.	0	2 min	
Total: 22 rds					
Exercise Scoring Fully Trained (T) = Satisfactory on 5 of 5 tasks Need Practice (P) = Satisfactory on 4 tasks Untrained (U) = Unsatisfactory on 3 or fewer tasks					

Table I-4. Night fire exercise.

During scoring procedures, the grader positions himself so that he can observe both the gunner and the target. Once the exercise commences, he:

- Times the tasks having a time standard.
- Observes and informs the gunner of the strike of the rounds.
- Records the results of each task in the right hand column with a “Y” for a satisfactory completion of the task or a “N” for an unsatisfactory completion.

- Sums the results and assigns an overall score in accordance with the scores in the bottom box of the figure above.

I-2. COLLECTIVE GUNNERY

These three exercises test the application of fire from two or more guns against linear, deep, linear with depth, and area targets. They test collective individual skills, fire control, leader skills, adjustment of fire, methods of target engagement, and the control of one or more fire units. Tables I-5 through I-7 should be used with unit LFXs. They can be held on any range or piece of terrain that supports the MK 19. Targets may be made up of 55-gallon drums, hulks of old vehicles, silhouettes, chalk, panel markers, or engineer tape.

ACTION	CONDITIONS	STANDARDS	AMMO	TIME	SAT Y/N
1. Engage a linear target with a pair of MK 19s (two guns). (see also Task 2)	Given a linear target 100 meters wide from 800 to 1,200 meters, two MK 19s on tripods with T&E mechanisms, during the hours of daylight or under degraded conditions.	Gun crews must cover 90 percent of the linear target with effective fire while performing the following: 1. The leader lays the guns on his respective flanks. 2. The leader issues the fire command for engaging a linear target. 3. Gunners engage using traversing fire. 4. Observers ensure that fires remain on the target and adjust appropriately.	40 rds	2 min	
2. Engage a linear target with two pairs of MK 19s (four guns).	Given a linear target 200 meters wide from 800 to 1,200 meters, four MK 19s on tripods with T&E mechanisms, during the hours of daylight or under degraded conditions.	Same as Task 1, except the leader may have to subdivide the target.	80 rds	3 min	

Table I-5. Linear and deep targets.

ACTION	CONDITIONS	STANDARDS	AMMO	TIME	SAT Y/N
3. Engage a deep target with a pair of MK 19s (two guns).	Given a deep target 100 meters long with midrange to the target from 800 to 1,200 meters, two MK 19s on tripods with T&E mechanisms, during the hours of daylight or under degraded conditions.	<p>Gun crews must cover 90 percent of the deep target with effective fire while performing the following:</p> <ol style="list-style-type: none"> 1. The leader lays the guns on his respective ends of the target. 2. The leader issues the fire command for engaging a deep target. 3. Gunners engage using searching fire. 4. Observers ensure that fire remains on the target and adjust appropriately. 	40 rds	2 min	
4. Engage a deep target with two pairs of MK 19s (four guns).	Given a deep target 200 meters long with midrange to the target from 800 to 1,200 meters, four MK 19s on tripods with T&E mechanisms, during the hours of daylight or under degraded conditions.	Gun crews should cover 90 percent of the deep target with effective fire while performing the same steps in task 3, except the leader may have to subdivide the target.	80 rds	3 min	
Total: 240 rds					

Table I-5. Linear and deep targets (continued).

ACTION	CONDITIONS	STANDARDS	AMMO	TIME	SAT Y/N
1. Engage a linear target with depth using a pair of MK 19s (two guns).	Given a target 100 meters wide and 50 meters long (or 50 meters wide and 100 meters long), from 800 to 1,200 meters, two MK 19s with tripods and T&E mechanisms, during daylight or under degraded conditions.	<p>Gun crews must cover 80 percent of the linear with depth target with effective fire while performing the following:</p> <ol style="list-style-type: none"> 1. The leader lays the guns on the gun crews' respective flanks (ends) of the target. 2. The leader issues the fire command for engaging a linear target with depth. 3. Gunners engage using traversing and searching fire. 4. Observers ensure that fire remains on the target and adjust appropriately. 	40 rds for each target.	3 min	
2. Engage a linear target with depth using two pairs of MK 19s (four guns).	Given a target 200 meters wide and 50 meters long (or 50 meters wide and 200 meters long), from 800 to 1,200 meters, four MK 19s with tripods and T&E mechanisms, during daylight or under degraded conditions.	Same as Task 1, except the leader may want to subdivide the target.	80 rds for each target.	4 min	
Total: 120 rds					

Table I-6. Linear targets with depth.

ACTION	CONDITIONS	STANDARDS	AMMO	TIME	TPU
1. Engage an area target with two pairs of MK 19s (four guns).	Given an area target from 1,000 to 1,400 meters (midrange) extending over 200 meters in length and width, four MK 19s on tripods with T & E mechanisms, during the hours of daylight or under degraded conditions.	<p>The combined gun crews must cover 70 percent of the area target with suppressive fire while performing the following:</p> <ol style="list-style-type: none"> 1. The leader determines direction and elevation to the area target (midrange). 2. The leader divides the area target and ensures that each gun is laid on its portion, and assigns TRPs. 3. Each gun registers on its respective TRP. 4. The leader issues the fire command for an area target. 5. All MK 19s engage; gunners use traverse and search manipulations to adjust and distribute fires. 6. Observers ensure the fires remain on target and adjust appropriately. 	160 rds	5 min	
2. Engage an area target with three pairs of MK 19s (six guns).	Given an area target from 1,000 to 1,400 meters (midrange), extending over 300 meters in length and 200 meters in width, six MK 19s on tripods with T&E mechanisms, during the hours of daylight or under degraded conditions.	<p>The combined gun crews must cover 70 percent of the area target with suppressive fire while performing the following:</p> <p>(Performance measures are the same as for Task 1.)</p>	240 rds	8 min	
Total: 400 rds					

Table I-7. Area targets.